

### **Remarks**

Reconsideration of the application is respectfully requested in view of the forgoing claim amendments and following remarks. Claims 1, 2, 5-12, 15, 17, 21, 23, 25-30, 32-34, 37, 40, 41, and 43-50 are pending in this application. All pending claims are rejected.

### ***Cited Art***

Kirby et al., Analysis of Applying Artificial Neural Networks for Employee Selection" AMCIS 1998 ("Kirby").

Decision Point Data, Inc., "1999 StoreWorks! Conference and Exhibition" May 1999 ("DPD").

Morrow et al., "Using Absenteeism and Performance to Predict Employee Turnover: Early Detection through Company Records" 1999 ("Morrow").

Mark John Somers "Application of two neural network paradigms to the study of voluntary employee turnover" 1999 ("Somers").

Kaak, "The Weighted Application Blank," April 1998 ("Kaak").

### ***Amendments to Specification***

Amendments to the specification have been made to correct typographical and grammatical errors. No new matter is added thereby.

### ***Claim Amendments***

#### ***Claim 1***

Claim 1 has been amended to include:

via information-theoretic feature selection, choosing questions from the pre-hire information as features for which respective pre-hire applicant responses serve as inputs to the model, wherein the information-theoretic feature selection comprises identifying at least one higher-order interaction comprising a set of a plurality of questions having higher predictive power than a sum of predictive powers of individual questions in the set;

Support is found, for example, at page 50, lines 4 *et seq.* of the Application:

Information-theoretic feature selection can be used to choose appropriate inputs for a model. In the following example, the source for the data used to develop the model was a large national video rental company. The sample contains over 2000 cases, with 160 responses to application questions collected prior to hiring and tenure (in days) for former employees. The model was constructed to predict the length of employment for a given applicant, if hired.

Higher-order interactions are described at page 54, lines 13 *et seq.*:

Higher-order interactions are synergies between variables where the predictive power of a set of variables is significantly higher than that of the sum of the individual variables.

Table 8 of page 56 of the Application shows higher-order transmissions between various questions and tenure.

### *Claim 23*

Claim 23 has been amended to recite “considering various sets of permutations of predictive items.” For example, support is found at page 14, line 15 *et seq.* of the Application:

One technique for identifying ineffective predictors is to consider various sets of permutations of predictive items (e.g., answers to job application questions A, B, C, A & B, A & C, B & C, and A & B & C) and evaluate whether the permutation set is effective. If an item is not in any set of effective predictors, the item is identified as ineffective. It is possible that while an item alone is ineffective, it is effective in combination with one or more other items. Additional features of information transfer-based techniques are described in greater detail below.

### *New Claim 46*

New dependent claim 46 has been added to place a feature in claim 1 relating to payroll information into a dependent claim. Claim 44 now depends from claim 46.

### *New Claim 47*

Support for dependent claim 47 is found, for example, at page 59, lines 10 *et seq.*

of the Application.

*New Claims 48-50*

New dependent claims 47-50 recite various features related to higher-order interaction. Support is found, for example, at page 56, line 5 – page 57, line 28 of the Application.

*Other Claims*

Claims 15, 35, 37, 40, and 41 have also been amended to recite “information-theoretic feature selection.”

***Rejections under 35 U.S.C. § 103***

*Claims 1, 5-12, and 44*

Claims 1-2, 5-12, and 44 are rejected under 35 U.S.C. § 103(a) as unpatentable over Kirby, and further in view of DPD, and evidenced by Morrow.

**Kirby’s brief description of a neural network and DPD’s brief description of an electronic system is insufficient to render “via information-theoretic feature selection, choosing questions from the pre-hire information as features for which respective pre-hire applicant responses serve as inputs to the model, wherein the information-theoretic feature selection comprises identifying at least one higher-order interaction comprising a set of a plurality of questions having higher predictive power than a sum of predictive powers of individual questions in the set” even in light of Morrow.** Kirby does describe at page 1 “an artificial neural network system as a decision aid for employee selection.” DPD does describe at slide 3 an “Electronic Application and Profiling System.” However, as understood by Applicants, neither describes “information-theoretic feature selection” as recited by claim 1.

Morrow at page 1 describes “Records revealed that 113 of the company’s 816 employees had voluntarily left the firm over a 2-year period.” However, as understood

by Applicants, Morrow is silent regarding “information-theoretic feature selection” as recited by claim 1. Accordingly, claim 1 is allowable over Kirby/DPD/Morrow, alone or combined.

A feature concerning determining tenure of an applicant is preserved at claims 44 and new claim 46. The Action asserts that it was “notoriously well known” to determine employment duration from payroll data and to calculate tenure from the date of termination to the date of hiring – and that the dates are available in the payroll data/record. Applicants do not dispute that it was well known how to determine tenure after date of hire and date of termination are known. However, in practice, such dates are not always available or reliable in payroll data, particularly data received “via a network.” Accordingly, determining a termination date from payroll data may not be a simple matter of reading a date from a field. Applicants thus challenge the assertion that it was notoriously well known to determine employment duration from payroll data received via a network. Further, features of the claimed arrangements (e.g., “tracking whether the application has been dropped from payroll” in claim 44) were not well known as understood by Applicants. Proof of such assertions is demanded.

For at least these reasons, claim 1 and its dependent claims, 5-12, 44, and 46 are allowable over Kirby/DPD/Morrow.

#### *Claim 2*

Claim 2 has been amended to recite language similar to that of claim 1 and is therefore also allowable for at least the same reasons.

#### *Claims 15, 17, 21, and 45*

Claims 15, 17, 21, and 45 are rejected under 35 U.S.C. § 103(a) as unpatentable over Kirby, and further in view of Somers. Claim 15 has been amended to recite “information-theoretic feature selection.” As understood by Applicants, Kirby and Somers, alone or in combination, do not teach or suggest such an arrangement.

Accordingly, claim 15 is therefore allowable at this time along with its dependent claims, 17, 21, and 45-46.

*Claim 23*

Claim 23 is rejected under 35 U.S.C. § 103(a) as unpatentable over Kirby, and further in view of Kaak, as set forth in the previous office action for reason of record, and evidenced by Morrow.

Claim 23 has been amended to recite “considering various sets of permutations of predictive items.” As understood by Applicants, Kirby in view of Kaak does not teach or suggest such an arrangement.

Accordingly, claim 23 is allowable over Kirby and Kaak.

*Claims 25-30 and 32-34*

Claims 25-30, 32-34, 37, 41, and 43 are rejected under 35 U.S.C. § 103(a) as unpatentable over Kirby, in view of Kaak, and evidenced by Morrow.

Claim 25 has been amended to recite “information-theoretic feature selection.” As understood by Applicants, Kirby, Kaak, and Morrow, alone or in combination, fail to teach or suggest such an arrangement. Accordingly, claim 25 and its dependent claims, 26-30 and 32-34, are allowable at this time.

*Claim 37 and 43*

Claim 37 now recites “information-theoretic feature selection” and is therefore allowable over Kirby in view of Kaak, and evidenced by Morrow, along with its dependent claim, 43.

*Claim 41*

Claim 41 now recites “information-theoretic feature selection” and is therefore allowable over Kirby in view of Kaak, and evidenced by Morrow.

*Claim 40*

Claim 40 is rejected under 35 U.S.C. § 103(a) as unpatentable over Kirby, in view of Kaak, and further in view of DPD, as set forth in the previous office action for reason of record. Claim 40 now recites “information-theoretic feature selection” and is therefore allowable over Kirby in view of Kaak and further in view of DPD.

*“Well Known” Status*

For claims 25, 37, and 41, the Action asserts that “whether the job application will be involuntarily terminated, and whether the job applicant will be eligible for rehire upon termination” is “well known” in the art and points to Morrow. Applicants dispute that it is well known to make such a prediction **for a job applicant**. As understood by Applicants, Morrow describes predicting turnover for an organization, but not for a particular job applicant. Accordingly, Applicants must respectfully demand proof showing that such an arrangement is “well known.”

**Conclusion**

The claims in their present form should now be allowed. Such action is respectfully requested.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

One World Trade Center, Suite 1600  
121 S.W. Salmon Street  
Portland, Oregon 97204  
Telephone: (503) 595-5300  
Facsimile: (503) 595-5301

By

  
Gregory L. Maurer  
Registration No. 43,781